



## Summer | Sun Solar Ovens: Harnessing Heat

### Summary:

Looking for a way to cook tasty goodness from the garden? Put the abundant energy of the sun to use using recycled materials!

### Before Visiting the Garden:

**Gather:** A pizza delivery box or similar box, scissors or box cutter, aluminum foil, clear tape, plastic wrap, ruler, and thermometer, ruler, and oven mitts

**Recipe:** Tomatoes and Basil (from the garden), Mozzarella Cheese, Balsamic Vinegar, Salt, and French bread

**Explore:** Images of the sun from NASA's Solar Dynamics Observatory: [https://www.nasa.gov/mission\\_pages/sdo/main/index.html](https://www.nasa.gov/mission_pages/sdo/main/index.html)

**Read:** *Far Out Guide to the Sun* by Mary Kay Carson. The book has multiple chapters so pick one you like or skip ahead to Chapter Three on solar power.

### In the Garden:

The sun is great for helping our plants grow but it can also be a great source for cooking what we harvest from our plants.

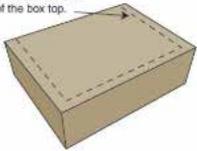
### Questions to Explore:

- How do you cook your food?
- Have you ever cooked using the sun? (Perhaps not food but what happens to your skin in the sun? A rock in a sunny location?)
- Compare the feeling of a sunny patch of asphalt in the parking lot to a sunny patch of soil. Does the sun seem hotter in either spot?
- What could you use to make the heat of the sun even hotter? (window glass, a mirror, etc.)

### Activity:

Scientists have been working hard to better understand something gardeners know a lot about, the sun. Scientists are trying to find ways to use the sun to power larger structures, like our houses, and smaller things we find in the city, like parking meters. Today we are going to experiment with a solar oven. The weather is warm now, but as you work on your oven, discuss how you might use some of the principles of an oven to extend our growing season into the cool fall and winter months.

Cut here, 1 inch from the edge of the box top.



1. Using the straight edge as a guide, cut a three-sided flap out of the top of the box, leaving at least a 1-inch border around the three sides.

2. Cover the bottom (inside) of the flap with aluminum foil, spreading a coat of glue from the glue stick onto the cardboard first and making the foil as smooth as possible.

3. Line the inside of the box with aluminum foil, again gluing it down and making it as smooth as possible.

4. Tape two layers of plastic wrap across the opening you cut in the lid—one layer on the top and one layer on the bottom side of the lid.

5. Test the stick you will use to prop the lid up. You may have to use tape or figure another way to make the stick stay put.

#### Time to Cook

6. Set the oven in the direct sun, with the flap propped to reflect the light into the box. You will probably have to tape the prop in place. Preheat the oven for at least 30 minutes.

7. Place your ingredients on a sheet of aluminum in the preheated solar oven. Layer a piece of mozzarella under a piece of basil with a tomato on top. Put a few slices of bread on the side to toast.

8. Close the oven lid (the part with the plastic wrap on it) tightly, and prop up the flap to reflect the sunlight into the box.

\*source: <http://climatekids.nasa.gov/smores/>

When your cheese is melted and your bread toasty, carefully pull your ingredients out of the oven.



Make sure the foil inside the flap is very smooth, to make it like a mirror.



Two layers of plastic wrap over the opening will help keep heat in, while still letting all the light shine through.



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### Beyond the Garden | Solving It with Sunshine

The energy of the sun is being harvested in all sorts of interesting ways. Do a little research at your local library on solar power and check in with the reference librarian. They might be able to help you find spots in your community that are using solar power.

### Continue Exploring | Supporting Materials

Make a solar still for purifying water: <http://pbskids.org/zoom/activities/sci/solarstill.html>

Check out a solar farm: <http://www.smithsonianmag.com/science-nature/take-a-look-at-the-worlds-largest-solar-thermal-farm-91577483/?no-ist>